Claims

1. The use of erythropoietin and/or derivatives thereof to stimulate physiological mobilization of endothelial progenitor cells, proliferation of endothelial progenitor cells, differentiation of endothelial progenitor cells to endothelial cells and/or migration of endothelial progenitor cells in the direction of an angiogenic or vasculogenic stimulus.

2. The use as claimed in claim 1, where the adhesion ability of differentiating endothelial progenitor cells is increased.

3. The use as claimed in claim 1 or 2, where the stimulation of endothelial progenitor cells leads to the formation of endothelial tissue.

4. The use as claimed in any of claims 1 to 3, where the stimulation of endothelial progenitor cells leads to the formation of new blood vessels.

5. The use of erythropoietin and/or derivatives thereof to stimulate the formation of endothelial tissue.

6. The use of erythropoietin and/or derivatives thereof to stimulate vasculogenesis.

7. The use of erythropoietin for the therapy of pathological states or diseases of the human or animal body associated with a dysfunction of endothelial progenitor cells.

8. The use as claimed in claim 7, where the dysfunction of endothelial progenitor cells consists of their impaired ability to proliferate, their impaired ability to differentiate to endothelial cells, their impaired ability to adhere and/or their impaired ability to migrate in the direction of a vasculogenic or angiogenic stimulus.

9. The use as claimed in claim 7 or 8, where the dysfunction of endothelial progenitor cells impairs or prevents the formation of endothelial tissue and/or blood vessels.

10. The use as claimed in any of claims 7 to 9, where the dysfunction of endothelial progenitor cells has a pathogenic cause.

11. The use as claimed in any of claims 7 to 10, where the pathological states or diseases associated with a dysfunction of endothelial progenitor cells are hypercholesterolemia, diabetes mellitus, endothelium-mediated chronic inflammatory disorders, endotheliosis including reticuloendotheliosis, atherosclerosis, coronary heart disease, myocardial ischemia, angina pectoris, age-related cardiovascular disorder, ischemic disorders of the extremities, preeclampsia, Raynaud's disease, pregnancy-induced hypertension, chronic or acute renal failure, especially terminal renal failure, heart failure, wound healing and sequelae thereof.

12. The use of erythropoietin for the therapy of hypercholesterolemia, diabetes mellitus, endothelium-mediated chronic inflammatory disorders, endotheliosis including reticuloendotheliosis, atherosclerosis, coronary heart disease, myocardial ischemia, angina pectoris, age-related cardiovascular disorder, ischemic disorders of the extremities, preeclampsia, Raynaud's disease, pregnancy-induced hypertension, chronic or acute renal failure, especially terminal renal failure, heart failure, wound healing and sequelae thereof.

13. The use as claimed in any of claims 7 to 12, where erythropoietin is administered in a dose of from 200 to 2 000 units/week per patient.

14. The use as claimed in claim 13, where erythropoietin is administered in a dose of from 500 to 2 000 units/week per patient.

15. The use of erythropoietin for producing a pharmaceutical composition for the therapy of pathological states or diseases associated with a dysfunction of endothelial progenitor cells.

16. The use as claimed in claim 15, where the pathological states or diseases associated with a dysfunction of endothelial progenitor cells are hypercholesterolemia, diabetes mellitus, endothelium-mediated chronic inflammatory disorders, endotheliosis including reticuloendotheliosis, atherosclerosis, coronary heart disease, myocardial ischemia,

angina pectoris, age-related cardiovascular disorder, ischemic disorders of the extremities, Raynaud's disease, preeclampsia, pregnancy-induced hypertension, chronic or acute renal failure, especially terminal renal failure, heart failure, wound healing and sequelae thereof.

17. The use of erythropoietin for producing a pharmaceutical composition for the therapy of hypercholesterolemia, diabetes mellitus, endothelium-mediated chronic inflammatory disorders, endotheliosis including reticuloendotheliosis, atherosclerosis, coronary heart disease, myocardial ischemia, angina pectoris, age-related cardiovascular disorder, ischemic disorders of the extremities, Raynaud's disease, preeclampsia, pregnancy-induced hypertension, chronic or acute renal failure, especially terminal renal failure, heart failure, wound healing and sequelae thereof.

18. The use as claimed in any of claims 15 to 17, where the pharmaceutical composition is suitable for parenteral, in particular intravenous, intramuscular, intracutaneous or subcutaneous, administration.

19. The use as claimed in claim 18, where the pharmaceutical composition is in the form of an injection or infusion.

20. The use as claimed in any of claims 15 to 17, where the pharmaceutical composition is suitable for pulmonary administration.

21. The use as claimed in claim 20, where the pharmaceutical composition is in the form of an aqueous solution, nonaqueous solution or powder.

22. The use as claimed in claim 20 or 21, where the pharmaceutical composition is in the form of an aerosol product.

23. The use as claimed in any of claims 15 to 17, where the pharmaceutical composition is suitable for oral administration.

24. The use as claimed in claim 23, where the pharmaceutical composition is in the form of a solution, suspension, emulsion or tablet.

25. The use as claimed in any of claims 15 to 24, where the pharmaceutical composition comprises at least one further active ingredient to stimulate endothelial progenitor cells.

26. The use as claimed in claim 25, where the further active ingredient is VEGF, PIGF, GM-CSF, an HMG-CoA reductase inhibitor and/or an NO donor.

27. The use as claimed in claim 26, where the HMG-CoA reductase inhibitor is a statin such as simvastatin, mevastatin or atorvastatin.

28. The use of erythropoietin for producing a transplantable endothelial cell preparation.

29. The use as claimed in claim 28, where endothelial cells are produced in vitro by cultivating endothelial progenitor cells in the presence of erythropoietin.

30. The use as claimed in claim 28 or 29, where the cultivation of the endothelial progenitor cells takes place in the presence of at least one further active ingredient selected from the group consisting of VEGF, PIGF, GM-CSF, an HMG-CoA reductase inhibitor, especially simvastatin, mevastatin or atorvastatin, and an NO donor, especially L-arginine.

31. The use of erythropoietin for the pretreatment and/or further treatment of tissue or organ transplants.

32. The use as claimed in claim 31, where the pretreatment of the tissue or organ transplants takes place with use of isolated endothelial progenitor cells.

33. The use of erythropoietin for producing implantable or transplantable cell-containing in vitro organ or tissue systems, where the in vitro organ or tissue systems are treated with erythropoietin before the transplantation or implantation to induce vasculogenesis and/or endothelial cell formation.

34. The use as claimed in claim 33, where the in vitro organ or tissue systems comprise endothelial progenitor cells.

35. The use of erythropoietin to produce vascular prostheses or heart valves, where the vascular prostheses or heart valves are coated with erythropoietin.

36. The use as claimed in claim 35, where the coating of the vascular prostheses or heart valves comprises endothelial

progenitor cells.

37. The use as claimed in any of claims 1 to 36, where erythropoietin is human or animal erythropoietin.

38. The use as claimed in claim 37, where erythropoietin is a derivative, an analog, a modification or a mutein of erythropoietin.

39. The use as claimed in claim 37 or 38, where erythropoietin is isolated from human urine, the urine or plasma of patients suffering from aplastic anemia, tissue cultures of human renal cancer cells, human lymphoblast cells having the ability to produce human erythropoietin, or a hybridoma culture obtained by cell fusion of a human cell line.

40. The use as claimed in claim 37 or 38, where erythropoietin is an erythropoietin produced by DNA recombination techniques.

41. A pharmaceutical composition to stimulate endothelial progenitor cells, to stimulate the formation of endothelial tissue, to stimulate vasculogenesis and/or for the treatment of diseases or pathological states associated with a dysfunction of endothelial progenitor cells, comprising erythropoietin and/or a derivative, an analog, a modification or a mutein thereof as active ingredient, and at least one further active ingredient selected from the group consisting of VEGF, PIGF, GM-CSF, an HMG-CoA reductase inhibitor and an NO donor.

42. A pharmaceutical composition for the prophylaxis and/or therapy of hypercholesterolemia, diabetes mellitus, endothelium-mediated chronic inflammatory disorders, endotheliosis including reticuloendotheliosis, atherosclerosis, coronary heart disease, myocardial ischemia, angina pectoris, age-related cardiovascular disorder, ischemic disorders of the extremities, preeclampsia, Raynaud's disease, pregnancy-induced hypertension, chronic or acute renal failure, especially terminal renal failure, heart failure, wound healing and sequelae thereof, comprising erythropoietin and/or a derivative, an analog, a modification or a mutein thereof as active ingredient.

43. The pharmaceutical composition as claimed in claim 42, additionally comprising a further active ingredient selected from the group consisting of VEGF, PIGF, GM-CSF, an HMG-CoA reductase inhibitor and an NO donor.

44. The pharmaceutical composition as claimed in claim 41 or 43, where the HMG-CoA reductase inhibitor is a statin such as simvastatin, mevastatin or atorvastatin.

45. The pharmaceutical composition as claimed in claim 41 or 43, where the NO donor is L-arginine.